most interesting piece of apparatus was a three-phase motor carried on a suspended bed, so that the torque could be measured, and driving a dynamo coupled direct to the end of the shaft. The other end of the motor spindle was fitted with a disc divided into black and white sectors, so that the slip of the rotor when driving the dynamo at various loads could be directly observed by the stroboscopic effect produced on illuminating the disc with an incandescent lamp on the mains supplying the current. There are also two other small motor generators, and a motor of about three horse-power fitted with an electromagnetic brake disc.

The photometry room contains a Lummer Brodhun photometer with Hefner Alteneck standard for general photometric work. For variations of light in arc lamps, as shown by the illumination in a plane, a photometer due to Prof. Rousseau is used. This consists of a vertical disc with two radial arms carrying mirrors. The arc is placed in the axis on one side of the disc, and the light is reflected by the mirrors on to the other side, where it gives two shadows of an axial rod. One of the arms and the mirror on it being conveniently clamped, the other arm is moved from point to point, and the mirror on it is adjusted until the shadows are equally intense as in a Rumford photometer. The variation of the light is thus found in terms of the fixed direction, and the absolute value of this is found, if desired, by means of a Weber photometer.

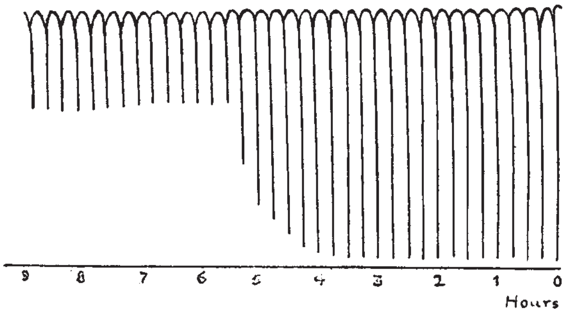

Fig. 1.—Graphic record of cement test.

The engineering laboratories contain a small experimental steam engine and other plant, including a dynamo driven by a high speed steam engine, a gas engine and pumps. Complete efficiency tests are carried out, of which the students are required to write detailed reports. There is also a 100 ton testing machine. This is worked hydraulically, the town water being received at three atmospheres and transformed to 250 atmospheres. There is also a fine adjustment worked electrically, the forward or reverse motion being put on by an electromagnetic coupling.

At the time of the visit tests were being made on the deflection of cement beams used for arching in floor work. They were being loaded up to the point of fracture.

One of the most interesting pieces of apparatus was that used for testing the setting qualities of Portland cement. For testing, the cement is made up in a mould about 3 inches in diameter and 1½ inches thick. This is rotated slowly about its axis by clockwork, which allows a needle weighted with 300 grammes to fall once every quarter of an hour. If the cement is soft, it pierces the cement to the bottom, but as hardening sets in the needle does not pierce the full thickness, until finally it fails to make any impression. The result is automatically recorded as shown in the figure (Fig. 1), in which the ordinates represent travel of the needle, and abscissæ time. It will be noticed that the effect of hardening in this example appeared after about 4 hours, and the needle failed to make an impression after 5½ hours.

The Italian visit made it evident that not only was beautiful scenery to be enjoyed, but that Italy is at present the home of some of the most interesting and original engineering works.

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## *NOTES.*

The Royal Society's Croonian lecture will be delivered on Thursday, April 30, by Prof. Klement A. Timirjazev, upon "The Cosmical Function of the Green Plant."

A correspondent informs us that on April 1 Dr. G. V. Neumayer left the Deutsche Seewarte at Hamburg, of which he had been director since 1876.

A Reuter message from St. Petersburg announces that the Imperial Russian Geographical Society will send a scientific expedition into Mesopotamia during the year. The expedition will be under the leadership of M. Kaznakoff, and will include among its members M. Alferaki, zoologist, and M. Tolmatcheff, geologist.

The President of the Board of Agriculture has appointed a Departmental Committee to investigate experimentally and to inquire into and report upon:—(1) The composition and essential constituents of efficient dips and other preparations for the treatment and dressing of sheep, and their effect upon the animal treated or dressed, and upon the parasites and other organisms for the destruction of which they are used; (2) the methods in which such dips and other preparations should be employed, and the appliances and facilities requisite for the purpose; (3) the times and intervals at which sheep should be treated or dressed, regard being had (*a*) to the life-history and characteristics of the sheep-scab Acarus and of the other parasites and organisms of sheep which require external treatment, and (*b*) to the practical conditions under which sheep-farming is carried on in various parts of the United Kingdom. The committee includes Dr. T. E. Thorpe, C.B., F.R.S., Prof. J. R. Campbell, Mr. A. C. Cope, Mr. M. Hedley, and Dr. W. Somerville. Prof. Winter will act as secretary to the committee.

Mr. W. de Fonvielle writes to say that for the first time since the Eiffel Tower was open to the public in 1889, it was used for astronomical purposes on the occasion of the recent lunar eclipse (April 11–12), when a number of members of the Société astronomique de France spent some hours making observations on the terrace of the monument at an altitude of about 870 feet above the Seine.

A Reuter telegram from Colon states that slight shocks of earthquake occurred there and at Panama on the morning of April 17.

The *Athenaeum* announces the death, in his seventy-third year, of Prof. Laborde, of the Paris School of Anthropology, and of M. E. Duporcq, the secretary of the French Mathematical Society, at the early age of thirty-one.

A general agreement has been arrived at between Marconi's Wireless Telegraph Company and a group of Danish financiers in Copenhagen for the establishment of a wireless system between Iceland and the north of Scotland.

The following announcement appeared in Saturday's *Times* (April 18):—"Owing to the breakdown of a subsidiary device employed in connection with one of the telegraph stations established by the Marconi Company for

Transatlantic wireless telegraphy, the service of telegrams to the *Times* by Marconigraph from America is temporarily interrupted. The company state that the disablement of the apparatus is purely of a mechanical nature, and that the necessary repairs will shortly be completed."

A REUTER message from Rome states that the Marquis Luigi di Solari has submitted to Mr. Marconi, on behalf of the Italian Government, a convention for the establishment on the coast and on the islands off the Italian coast of a system of twelve Marconi radio-telegraph stations of an average range of 300 kilometres. Some of these stations are to be complete before the end of the present year, and the others within the first half of 1904. Two of these twelve stations will be those already established at Punta di Vela and Montemario, which will, however, be strengthened. These will be exclusively reserved for military use; others, to be used for both military and commercial purposes, will be established at Capo di Leuca, near Gaeta, at Elba, and at Asinara.

PROF. FLEMING, in a long letter to the *Times* of April 14, describes in detail the experiments on syntony which he recently carried out at Poldhu. The letter does not embody much more information than was given in Prof. Fleming's Society of Arts lectures, which we have already summarised (p. 518). That Prof. Fleming himself was thoroughly satisfied with the results may be gathered from the following paragraph:—"This experiment," he writes, "which was very carefully carried out with all precautions necessary to prevent collusion between the assistants concerned, and to secure that the conditions were such as will exist in practice, appears to me to afford a complete demonstration of the truth of Mr. Marconi's statement that the waves sent out from his power stations do not, and will not, interfere with the reception of messages from his apparatus as placed on board ship." It is very satisfactory to have this assurance, but even without it one could not help feeling that the Marconi Co. would not have pushed ahead so fast with the Transatlantic signalling if by so doing they were ruining the intermarine communication which they have established.

WE are informed that it is the American Geographical Society, and not the U.S. National Geographic Society, which has awarded the Cullum medal to the Duke of the Abruzzi for his ascent of Mount St. Elias and his Arctic explorations.

REUTER'S Athens correspondent has announced that the Italian Archæological Mission has discovered, near Herakleion, in Crete, on the site of ancient Phaestos, a magnificent palace and various objects of exceptional interest analogous to those found at Knossos.

M. LIPPMANN is to succeed M. Poincaré as president of the French Astronomical Society next May. M. Janssen has been elected *president d'honneur*. The Society's prize has been awarded to M. Charlois for the discovery of a large number of minor planets, and the Jannsen prize to M. Giacobini for the discovery of seven comets.

THE International Conference on Deep-sea Investigation was opened at Wiesbaden on April 16, under the presidency of the Prince of Monaco, representatives of geography being present from England, Germany, France, Norway and Sweden. The committee appointed by the Geographical Congress which met in 1899 presented a report on questions connected with oceanic research at great depths.

IN a letter addressed to Sir Alfred Jones by the expedition sent by the Liverpool School of Tropical Medicine to investigate the newly-discovered parasite of human trypanosomiasis, it is stated that a number of natives had been examined, but that the parasite had not been found in any. In two horses, however, a trypanosome was found, and it is stated that another horse had been infected with the human trypanosome. In a common species of horse fly that had fed on this last horse, numerous trypanosomes were found in the stomach. The letter was sent from McCarthy Island, 150 miles in the interior of Gambia.

WE learn from the *Times* that Dr. Jonathan Hutchinson, F.R.S., has now returned from his tour in India and Ceylon, in which countries he has been studying the ætiology of leprosy. Dr. Hutchinson has always held that leprosy is connected in some way with the eating of fish, and it was to test the truth of this hypothesis that he has made this tour, and, shortly before, one to South Africa. Dr. Hutchinson, as the result of his inquiries, believes that only in a very small minority of cases of leprosy can a fish diet be excluded. Its great prevalence is almost always in or near a fishing district. Dr. Hutchinson's general conclusion is that, as regards leprosy in India, there are no facts which controvert or render untenable the fish hypothesis, and that there are some which afford to it a support which he considers to be unassailable.

NEWS has been received at Berlin, from Australia, of the German Antarctic expedition under Dr. Erich von Drygalski, which left for the South Polar regions in 1901. The steamer *Stassfurt*, of the German Australian Steamship Company, reached Sydney on April 17 with four members of the expedition, who were landed at Kerguelen Island from the expedition ship *Gauss* for the purpose of making a year's magnetic and meteorological observations, which were necessary for the main expedition in order to confirm the observations taken further south. One of the observing party, Dr. Enzensperger, died of beri beri on the island on February 2, and Dr. Werth, geologist, who is among those landed from the *Stassfurt*, was also taken seriously ill. He is now better, but will be detained in hospital. The remaining three explorers are well.

DR. HANS REUSCH describes in *Naturen* for March the only known natural fountain in Norway, locally known as Bubbelen. It lies in a remote and little-known valley, Bognelvdal, 10 kilometres south of Sopnaes, at the head of Langfjord, a branch of Altenfjord, Lapland, 70° N. 22° E. It is formed by a stream which itself is fed by the overflow of a river, and has flowed underground through the limestone for three kilometres. The fountain rises from a basin six metres deep in a column of water which varies in size according to the season, and flows away as a stream, which even in dry weather is seven metres broad and two metres deep.

THE Naples Academy of Physical and Mathematical Sciences offers a prize of 1000 lire to the author of the best memoir on the theory of the invariants of the ternary biquadratic form, preferably in connection with the conditions for splitting into lower form. The papers may be written in Italian, Latin, or French, and must be sent in on or before June 30, 1904. In addition prizes are offered in connection with the legacy of Prof. Luigi Sementini, who in 1847 left a sum of 150 ducats per annum "to distribute it as a prize for three memoirs on applied chemistry which they shall judge the best, or to award it as a prize to the author of one single memoir containing great utility, or finally to give it as a life pension to the author of a classical discovery useful to sick mankind." Competitors for this prize are invited to send in their applications, accompanied by manuscript or printed papers, not later than December 31, 1903.

A NOTE in the *Times* refers to a report by Mr. Neville-Rolfe, British Consul in Naples, in which he mentions the widespread interest now being taken in Italy in the question of reafforesting the country. In 1877 about four millions of acres were withdrawn from the operation of the old forest laws, as well as about one million acres in Sicily and Sardinia. The consequence was a reckless destruction of forests, and now it is generally admitted that the State must step in to save those that are left and to aid in replanting. The question now being discussed is what trees are to be used for the latter purpose.

THE increase of temperature referred to in our last issue, caused by the advance of a small cyclonic disturbance on Tuesday, April 14, was of short duration; by the morning of April 15 the centre of the disturbance had reached the Dutch coasts, and in its rear the winds had become northerly; the day temperatures again became abnormally low. Severe frosts on the ground occurred at night, which, up to Tuesday last, have been continuous at Greenwich for ten days; the mean of the terrestrial radiation temperatures there for the week ending April 20 was 20°·8, being 10° lower than the mean for the corresponding period last year. On the morning of April 18 a temperature of 24° was registered at Newton Reigny and Dungeness. Such a low temperature had not been registered in the neighbourhood of the latter station, in April, in the values for thirty years published by the Meteorological Office.

A VIOLENT snowstorm passed over Berlin on Sunday night, and the snow lay several inches deep in the streets on the following morning, April 20. The Berlin correspondent of the *Times* states that more than forty trees were blown down in the Thiergarten. The Royal Park at Potsdam has suffered very severely, and many valuable trees planted in the time of Frederick the Great have been uprooted. Telegraphic communication with Sweden and Russia was interrupted, and many of the inland wires to the eastward of Berlin have broken down. The trains from the provinces of Posen, Silesia, and East and West Prussia arrived at Berlin many hours late on Monday, and on many sections of the railways in the eastern half of the Kingdom of Prussia traffic was completely interrupted. In Denmark the gale was even more severe. Trains could not proceed from Copenhagen in any direction, and telegraphic and telephonic communication was also interrupted. On Monday the Danish capital was, in fact, almost entirely cut off from communication with her immediate environs and with other countries. Snow reached a depth of four to six feet. Two local trains sent from Copenhagen with snow-ploughs only reached from ten to twenty miles from the capital. A severe snowstorm swept over the whole province of Petrikovo, Russia, on April 21.

WE have received the report of the Government Observatory, Bombay, for the year 1902; the director, Mr. N. A. F. Moos, is assisted by a native staff of ten members. The observatory is well equipped with self-recording instruments, and directs its attention chiefly to terrestrial magnetism, meteorology, and seismology, and to some extent to astronomical observations. The work appears to have been carried out with great efficiency; the seismic observations show distinct evidence of sudden increased activity during the year, and it is stated that the records promise to be of considerable value in connection with the relation which probably exists between earthquake phenomena and terrestrial magnetism. Special magnetic observations have been made (at times every twenty seconds) in connection with the international programme decided on during the period of the English and German Antarctic expeditions.

ALTHOUGH the surface wind was from the east, the dust cloud from the eruption of the Soufrière of St. Vincent at 6.30 a.m. on March 22 reached Bridgetown, Barbados, 100 miles to eastward, by 9 a.m., so that its rate of motion was not less than forty miles an hour after having attained an elevation of probably three miles at least above the Soufrière. Its altitude above Barbados was estimated at about 8000 feet, or double the height of the Soufrière. At several points the first fall of dust was observed at 11.15 a.m., it increased until 1.30 p.m., then diminished, and by 5 p.m. it had ceased. In the neighbourhood of Bridgetown the fall was at the rate of about 2½ tons per acre; considerably less at Bathsheba, fourteen miles to the north-east; while at Codrington House, two miles north of the town, it amounted to 6·52 tons per acre. Taking 3 tons per acre as the average would give 300,000 tons for the whole island. The May dust was a very light grey, that of March very dark—almost black, Dr. Spencer describing the March dust cloud as of a deep Prussian blue colour.

THE Imperial Department of Agriculture for the West Indies has now published the complete report and statistical information relating to the sugar-cane experiments in the Leeward Islands, Antigua and St. Kitts, in the season 1901–02. Part i., 55 foolscap pages, deals with experiments with varieties of sugar-cane, with an appendix on the chemical selection of sugar-cane. Part ii., 115 pages and six large diagrams, treats of manurial experiments. The general results have already been noticed in these columns.

THE London County Council has now issued the complete report upon the examination of the atmosphere of the Central London Railway, carried out by Dr. Clowes and Dr. Andrewes. A short statement of results submitted to the Council has already been described (p. 488). Generally, the amount of carbon dioxide was largest in the air of the carriages, but not, as might have been expected, in the smoking carriages. The highest proportion of carbon dioxide found was 14·7 volumes and the smallest proportion 9·6 volumes in 10,000 volumes of air. The air in the passages leading to and from the stations was generally better than in the lifts—on one occasion as much as 15·2 volumes of carbon dioxide in 10,000 volumes of air were present in a lift; but of all the samples 22 per cent. contained less than twice as much, and 34 per cent. contained less than 2½ times as much carbon dioxide as that found in outside air. Dr. Clowes suggests as a standard that air taken at any point on the railway should not contain more than 8 volumes of carbon dioxide in 10,000 of air. The bacteriological examination of the air by Dr. Andrewes showed micro-organisms to be present in somewhat greater proportion than in the fresh outside air in the ratio of about 13 to 10, the number of organisms being proportional to the concentration of human traffic. The air of the railway does not in its bacterial content compare unfavourably with inhabited rooms generally, and no pathogenic germs were detected.

IN the April number of *Climate* Dr. Louis Sambon gives an admirable popular account of malaria, illustrated by a number of original drawings by Signor Terzi. Dr. Harford discusses the physical qualifications necessary for residence or travel in the tropics, and there are other articles upon the "Spread of Yellow Fever," "Surgical Emergencies," and "Sanitary Reform in West Africa."

A SECOND edition has appeared of the "Meteorologia Dinamica," by P. A. Rodrigues de Prada, director of the Vatican Observatory. It is published in Madrid, and deals with atmospheric tides, winds, cyclones, and air currents generally.

MESSRS. HOEPLI, of Milan, have issued the second edition of Ingegnere G. Vacchelli's book on "Le Costruzioni in Calcestruzzo," the first edition of which appeared in 1899. It is one of the Manueli Hoepli, and deals with the properties of concrete, cement, and hydraulic lime, and their uses for building purposes. Special attention is given to the use of cements in the construction of bridges and submerged structures.

IN the *Atti dei Lincei*, xii., 6, Signor G. Guglielmo describes a method of determining the work-measure of the specific heat of water, which resembles the classical experiment of Joule in that the liquid is raised in temperature by agitation, but the liquid is contained in a closed vessel (the calorimeter of Fabre and Silbermann was used) having paddles or blades fixed projecting into the interior, and the agitation is effected by rotating the vessel alternately in one sense and then in the other.

SOME months ago the French Physical Society commenced the publication of a collection of elementary experiments in physics, and invited the cooperation of the members in describing experiments or details of apparatus which they had found useful, especially for teaching purposes. In a further circular the secretary, M. H. Abraham, states that the first part, dealing with geometry, mechanics, gravitation, hydrostatics and heat, is nearly complete, and the second part, dealing with acoustics, optics and electricity, is already in course of preparation.

THE French Physical Society held its annual exhibition of apparatus in Paris last week. The entrance hall and vestibule were lighted with "heliophone" lamps of the French Incandescent Gas Company, the staircase and ground floor by the French Oxyhydrogen Company, and the entrance hall of the first floor by Nernst lamps. Conferences were held in the Physics Theatre of the Faculty of Sciences on April 16, 17 and 18, at which the following papers were read:—On anomalous propagation of the form of vibrations in the neighbourhood of a focus, by M. G. Sagnac; recent researches in radio-activity, by M. P. Curie; experiments on electric convection, by MM. Crémieu and Pender; and further experiments on electric convection, by M. Vasilesco Karpen.

THE *Bulletin de la Société d'Encouragement* for February 28 contains two papers of interest in connection with the problem of aërial navigation. In the first of these M. Barbet describes the latest experiments by M. Canovetti, of Brescia, on the resistance of the air to moving bodies of various shapes. The method, which has already been described in previous papers, consists in attaching the body under observation to a small trolley (chariot) which descends under gravity, along a wire 380 metres long stretched from the top of the fortifications at Brescia to a point on the plain below, the difference of altitude being 70 metres. By comparing the times of descent with those observed when the resisting body was removed, an estimate was formed of the coefficient of resistance. From experiments with aëroplanes, M. Canovetti found that an aëroplane of 200 square metres, weighing 1000 kilograms, moving at a speed of 16 metres per second, would require 100 horsepower to maintain it in the air, and that under these conditions the problem was impossible; further, that more power was necessary for driving an aëroplane through the air than for propelling an automobile of equal weight on a road. By experiments on the resistance of two circular discs placed one behind the other, M. Canovetti has plotted the form of the cone of air entrained by a moving disc.

IN the second paper Commandant P. Renard discusses the conditions of safety of navigable balloons, and suggests to the Société d'Encouragement a list of seventeen questions which should be put to the inventor of every navigable balloon before offering him official support or assistance. These questions refer to the provision of an adequate secondary gas bag (ballonet), which can be inflated by a sufficiently powerful ventilator driven by an independent motor, the satisfaction of the conditions of longitudinal stability, the avoidance of rigid parts, especially in the neighbourhood of the balloon, the arrangement of the motor and the gas valves in such a way as to minimise the danger of the escaping gases accumulating where they could be set on fire by the motor, the refrigeration of the gases escaping from the motor, the provision of fire extinguishing appliances, and last, but not least, the all-important question, "Are you a good aëronaut, or do you intend to take one with you?"

To the March number of *Petermann's Mitteilungen* Herr Arno Senfft contributes the first part of a paper on the ethnography of the island of Yap, in the Carolines. The botany of the Carolines has been treated by Prof. Volkens in his memoir on "Die Vegetation der Karolinen," and the geology by Dr. Kaiser in a paper published by the German Geological Society in 1902; Herr Senfft's paper is an important contribution towards the complete description of the group.

IN the *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, Dr. G. Wegener gives an account of the volcanic eruptions which occurred on Sawaii, in the Samoa islands, in the beginning of November last. There seems to be a good deal of evidence, geological and traditional, to show that volcanic disturbances occurred in the island within comparatively recent times, possibly about 200 years ago. The present activity is particularly interesting, because, after a long period of quiescence, the eruptions have recommenced without any violent display of energy.

FROM the Smithsonian Institution we have received a copy of a paper by Mr. R. S. Bassler on the structure of the extinct bryozoan genus Homotrypa, with descriptions of new species.

IN a recent issue of the *Proceedings* of the Boston Natural History Society (vol. xxxi., No. 1), Mr. M. T. Thomson describes the larva of *Naushonia crangonoides*, a rare shrimp, at present known in the adult condition by one specimen from Naushon Island and a second from Rum Island, both in the neighbourhood of Wood's Hole.

IN describing the best mode of rearing the curious larva of the annelid Polygordius, Prof. W. K. Brooks, in the *Johns Hopkins University Circulars* for March, comments on the circumstance that the adult has not hitherto been taken on the American coast. This he believes to be due to the lack of a sufficiently careful search.

ACCORDING to *Science* of March 27, the American Morphological Society and the zoologists of the central and western States have combined forces, under the title of the American Society of Zoologists, of which there is to be a western and an eastern branch. It is expected that the new body will meet once in three years, the meetings to be held alternately in the territories of the two branches.

In reference to an idea that beavers survived in Yorkshire until a very late period, Mr. T. Sheppard, in the *Naturalist* for April, explains that the item "bever-heads" occasionally met with in old parish accounts refers to the otter. He adds, however, that remains of the beaver have been found near Beverley, as well as in other parts of the county.

We have received vol. ii., part xiv., and vol. iii., parts i. and ii., of the *Annals* of the South African Museum. In the first of these Mr. S. Thor, of Christiania, treats of the South African water-mites (Hydrachnidæ), recording a number of new forms. In the second Dr. W. F. Purcell describes some new generic and specific types of Solpugidæ, and likewise gives an account of a collection of Arachnida recently made in one district of Cape Colony; while in the third Mr. Distant continues his notes on Rhynchota.

At Tonybee Hall to-morrow, April 24, a course of five lectures on "The How and the Why of Decoration" will be commenced by Dr. A. C. Haddon, F.R.S. The lectures will deal with the origins of designs, art and handicraft, art as a means of instruction, art and religion, and the decorative art of British New Guinea as an example of method.

Messrs. Macmillan and Co., Ltd., have added Kingsley's "Water-Babies" to their Illustrated Pocket Classics. The illustrations of Linley Sambourne are included, and it would be difficult to imagine a more attractive edition of this instructive fairy tale.

The drawings contained in the three volumes of Mr. W. S. Taggart's "Cotton Spinning" have been published in a separate book, under the title "Cotton Machinery Sketches," by Messrs. Macmillan and Co., Ltd., at 2*s*. 6*d*. The author believes that many teachers will find these drawings useful to accompany their lectures, even though they may not approve of text-books in general.

Messrs. J. and A. Churchill have published a second edition of "A Handbook of Physics and Chemistry," by Messrs. H. E. Corbin and A. M. Stewart. The primary object of the book is to meet the requirements of the first examination of the Conjoint Examining Board of the Royal Colleges of Physicians and Surgeons, and the new matter which has been added should increase the book's sphere of usefulness.

Amateur photographers will be glad to know that Messrs. R. and J. Beck, Ltd., have issued a second edition of "Photographic Lenses; a Simple Treatise," by Messrs. Conrad Beck and Herbert Andrews. The book is intended as a practical guide for the photographer to enable him to use his apparatus to better advantage; it does not profess to give complete scientific explanations of the laws underlying the construction of photographic lenses.

The additions to the Zoological Society's Gardens during the past week include a Purple-faced Monkey (*Semnopithecus cephalopterus*) from Ceylon, presented by Mr. T. Jenkins; a Bonnet Monkey (*Macacus sinicus*) from India, presented by Mr. C. A. Denison; a Long-tailed Weaver-bird (*Chera progne*) from South Africa, presented by Major R. W. P. Lodwick; a Brambling (*Fringilla montifringilla*), European, presented by Mr. H. Munt; a Large Grieved Tortoise (*Podocnemis expansa*) from the Amazons, presented by Senhor Francisco Alves Vieira; four Gallot's Lizards (*Lacerta galloti*) from Teneriffe, presented by the Hon. Rupert Drummond, R.N.; two Smith's Dwarf Lemurs (*Microcebus smithi*) from Madagascar, two Derbian Zonures (*Zonurus giganteus*), four Leopard Tortoises (*Testudo pardalis*) from South Africa, four Spanish Salamanders (*Chiroglossa lusitanica*) from Spain, deposited; a Shining Parrakeet (*Pyrrhulopsis splendens*) from the Fiji Islands, purchased.

## *OUR ASTRONOMICAL COLUMN.*

Nova Geminorum.—Further observations of the magnitude, appearance, and spectrum of this Nova have been made, and the results communicated to No. 3861 of the *Astronomische Nachrichten.*

Prof. Millosevich estimated the magnitude of the Nova on March 26d. 9h. (M.T. Rome) as 7·3–7·5, and recorded the colour as "yellow."

Dr. Halm, of Edinburgh, observed the spectrum with a small spectroscope attached to the 15-inch refractor on March 26, 27 and 28, and was convinced at first glance that the object was of the Nova type. On March 27 he found a faint continuous spectrum crossed by bright bands, those in the green and blue parts of the spectrum, including $H\beta$ and $H\gamma$, being especially conspicuous. The red part of the spectrum was very faint, and, although a careful scrutiny was made, no trace of the C line of hydrogen could be seen, but on observing the spectrum again on March 28 a bright point was seen to occupy that position. Dr. Halm estimated the magnitude of the Nova as about 8·0, and recorded the colour as a "bluish purple."

Drs. Ristenpart and Guthnick, of Berlin-Friedenau, made several estimations of the Nova's magnitude at 8·8h. (Central Europe M.T.) on March 29, and found for their general mean value 8·55m.

Prof. Hartwig, of Bamberg, estimated that the Nova was 0·3m. fainter on April 1 than it was on March 26, and Prof. Ceraski, of Moscow, estimated the magnitude as 8·3 at 10.30 p.m. on March 27. The latter observer could see no particular colour in the Nova, as it appeared white to him.

Spectrum of the Nebulosity Surrounding Nova Persei.—On account of the extraordinary changes of position and brightness in the nebula surrounding Nova Persei, Prof. Perrine, of Lick Observatory, thought it advisable to secure, if possible, a spectrum of the nebula, and for this purpose especially designed a spectroscope to be used with the Crossley reflector. The camera and collimator lenses were single quartz lenses of $1\frac{1}{8}$-inch aperture and 6 inches focal length; the prism also was quartz, and had a refracting angle of 50° 14′. A comparison spectrum of hydrogen was photographed on either side of the nebular spectrum.

A total exposure of 34h. 9m. was made on "condensation D" of the nebula on October 31, November 1, 2 and 4, and the resulting negative shows a very faint spectrum extending from $H\beta$ to about $\lambda$ 360, its length being about 0·11 inch. A second negative was obtained in order to demonstrate that the spectrum was not due to skylight, whilst a spectrum of skylight was obtained and proved to be quite different to the supposed nebula spectrum, so that it may be taken as proved that the spectrum obtained on the first negative is really due to the nebulosity.

Fully three-fourths of the light in the spectrum is condensed in the region extending from $H\beta$ to $H\gamma$: above $H\gamma$ the spectrum is very faint, and between $\lambda$ 380 and $\lambda$ 390 it is entirely absent. There appears to be a line almost coincident with $H\delta$, and another at $\lambda$ 370, but they are so faint that it is impossible to certify their presence.

It thus appears that the spectrum of the nebulosity corresponds to that of the Nova during the first few days of the latter's greatest magnitude in February, 1901. The positions of the two suspected lines at $\lambda$ 410 and $\lambda$ 370 do not agree at all with the strongest lines in the latest spectrum of the Nova, and there are no traces of the lines at $\lambda$ 387 and $\lambda$ 397 obtained by Campbell and Wright, nor of the very strong line at $\lambda$ 346 photographed by Mr. Stebbins (Lick *Bulletin*, No. 8). The spectrum of the nebulosity is certainly not the ordinary bright line spectrum of the nebulæ, and if the latter is present at all, it is in conjunction with another spectrum, probably continuous, extending